an allocation data amount with a coding difficulty for each unit time standardized in advance using an ordinary input signal of the type to which the input signal belongs, so as to obtain a reference value of the allocation data amount for each unit time interrelated with the coding difficulty supplied from the coding difficulty calculator 13. This reference value of the allocation data amount is modified by a controller 15 into an actual allocation data amount, according to which the input signal is coded by a moving picture image coding apparatus 18, so as to create coded data.

REMARKS

This preliminary amendment makes proper reference to parent application S/N 09/061,581; amends the specification and abstract to correct grammatical and typographical errors; and replaces original Claims 1-17 with Claims 18-29.

In the parent application, canceled Claims 1-2, 7-9, 12 and 15 (which correspond to new Claims 18-19, 22-24, 26 and 27, respectively) were finally rejected in the Office Action of July 20, 2001 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,949,956 ("Fukuda"). Claims 5-6, 11 and 16-17 (corresponding to new Claims 20-21, 25 and 28-29, respectively) were rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda in view of U.S. Patent No. 5,686,982 ("Chung et al."). Applicant respectfully submits that these claims are patentable over the cited references for at least the following reasons:

Contrary to Claim 18, for example, it is submitted that Fukuda does not disclose or suggest a signal coding method that includes at least the following:

> "obtaining a reference value of allocation data amount interrelated with said coding difficulty of said input signal for said each unit time based on a standardized relationship between coding difficulty and allocation data amount, wherein said standardized relationship is provided when a reference motion picture image sequence is coded by way of variable bit rate coding with a predetermined average bit rate;" (emphasis added)

To this end, the Office Action stated that Fukuda discloses the above-emphasized features at Col. 6, lines 25-41. Applicant respectfully disagrees. That passage of Fukuda refers to FIG. 6 and discloses that a video signal is fed to a coding difficulty detector 101 for determining a degree of coding difficulty. An average detector 601 detects an average value of image signal levels in a certain period of the video signal.

It is readily apparent that Fukuda's detection of an average value of image signal levels is not equivalent to Applicant's claimed method in which a reference value of allocation data amount is obtained with reference to a reference image sequence coded by way of variable bit rate coding with an average bit rate. As described in col. 6, lines 41 et seq., Fukuda detects the average value of video data signal levels because if the signal level is small, the coding difficulty is assumed to be low and the allocated coding bits do not need to be increased. When the allocated coding bits are too small, a deterioration in image quality due to encoding distortion will occur. The encoding distortion is rather emphasized when the video signal with a small signal level is increased in luminance, thus causing a higher quality deterioration. Fukuda purportedly prevents such a drawback by optimizing a linear transform action with the use of the average value of the signal levels. This technique is clearly not the same as Applicant's technique of obtaining a reference value of allocation data with the use of a predetermined average bit rate; and then modifying that reference value into an actual allocation data amount.

Accordingly, in light of the above distinctions, Applicants submit that Fukuda does not teach or suggest each and every feature of independent Claims 18, 23, 26 and 27; and therefore these claims are not anticipated by Fukuda under §102(e). Reconsideration and withdrawal of the rejections is therefore respectfully requested.

The remaining dependent claims in this application are patentable based at least upon their dependencies from the respective independent claims.

Chung et al. was relied upon for teaching pre-filter processing in the examiner's rejection of original claims 5-6, 11 and 16-17. Chung et al. likewise do not disclose or suggest the above-emphasized standardized relationship between coding difficulty and allocation data amount. As such, Chung et al. do not cure the deficiencies of Fukuda with respect to the Applicant's claims.

Conclusion

In view of the foregoing, entry of this Amendment, and the allowance of this application with Claims 18-29 are respectfully solicited.

The above statements concerning the disclosures in the cited references represent the present opinion of Applicant's representative and, in the event that the Examiner disagrees, Applicant's representative respectfully requests the Examiner specifically indicate those portions of the references providing the basis for a contrary view.

In the event that additional cooperation in this case may be helpful to complete its prosecution, the Examiner is cordially invited to contact Applicant's representative at the telephone number written below.

Attached hereto is a marked-up version of the changes made to the specification and by the current amendment. The attached page is captioned **"Version With Markings to Show Changes Made."**

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account 50-0320.

Respectfully submitted,
FROMMER LAWRENCE & HAUG LLP

By: ______________________

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning at page 2, line 10, has been amended as follows:

--For example, a video signal recorded on a so-called DVD-video is normally coded by a variable bit rate coding of two-path type. This two-path method is, for example, disclosed in the Specification and the drawings of Japanese [Paten] Patent Application 7-3313348 filed by the applicant of the present invention.--

The paragraph beginning at page 4, line 6, has been amended as follows:

--In order to reduce this processing time, a one-path type variable bit [rte] rate coding method is disclosed in the Specification and drawings of Japanese Patent Application 7-311418 filed by the applicant of the present invention.--

The paragraph beginning at page 5, line 6, has been amended as follows:

--In Fig. 4, the horizontal axis represents an appearance probability h(d) of a coding difficulty 'd' with the reference moving picture image sequence. An allocation bit amount for an arbitrary coding difficulty is calculated according to the function b(d). This relationship can be obtained empirically by coding a [plenty] large number of moving picture image sequences (for example, a movie) with a predetermined average bit rate and evaluating the obtained picture quality. Thus, this relationship is a general one which can be applied to most of the sequences in this world. According to this relationship of Fig. 4, an allocation bit amount 'b' is given for a coding difficulty 'd' per unit time of the input image from the terminal 200.--

The paragraph beginning at page 7, line 8, has been amended as follows:

--In order to achieve the aforementioned object, according to the present invention, an allocation [sign] data (e.g., bit) amount is interrelated with a coding difficulty for each unit time standardized in advance using an ordinary input signal of the type to which an input signal belongs, so as to determine a coding difficulty of the input signal for each unit time. For the coding difficulty of the input signal for each time unit, a reference value of the interrelated allocation [sign] data amount is determined for said each unit time. The reference value of the allocation [sign] data amount is modified into an actual allocation [sign] data amount. According this actual allocation [sign] data amount, the input signal is coded for said each unit time, so as to create a coded data. Thus, it is possible to carry out coding with an optimal allocation [sign] data amount according to a complexity of an input signal at real time.--

The paragraph beginning at page 7, line 23, has been amended as follows

--The aforementioned modification of the allocation [sign] data amount into an actual allocation [sign] data amount is carried out by controlling the actual allocation [sign] data amount so that a total of a generated bit amount generated when a time length of signal which can be recorded on a recording medium is equal to or below a bit amount available in the recording medium for signal recording.--

The paragraph beginning at page 8, line 16, has been amended as follows:

--According to [an] the information used when modifying the aforementioned allocation [sign] data amount reference value into an actual allocation [sign] data amount, the input signal is subjected to a pre-filter processing and the processed signal is coded, thus enabling [to make]

the signal coding deterioration to be made less remarkable. More specifically, when suppressing the actual allocation [sign] data amount below the allocation [sign] data amount reference value, an input image is subjected to a low-pass filter processing, thus enabling [to make] the coding deterioration of the image to be made less remarkable.--

The paragraph beginning at page 9, line 9, has been amended as follows:

--Moreover, [in] for the case that the input signal is a moving picture image signal, the coding difficulty is determined according to an image characteristic information of the input image for each predetermined period of time and coding is carried out with an allocation [sign] data amount reflecting human visual characteristic based on the image characteristic information.--

The paragraph beginning at page 22, line 23, has been amended as follows:

--According to the present invention, an allocation [sign] data sign amount is interrelated to a coding difficulty for each unit time standardized in advance from a general input signal of a type to which a particular input signal belongs, so as to obtain a coding difficulty of the input signal for each unit time, and for the coding difficulty of each unit time of this input signal, an allocation [sign] data amount reference value is obtained for each of the aforementioned interrelated unit time. The aforementioned allocation [sign] data amount reference value is modified into an actual allocation [sign] data amount, so that according to this actual allocation [sign] data amount, the input signal is coded for each of the unit time so as to create [a] coded data. Consequently, it is possible to carry out a coding with an optimal allocation [sign] data amount according to the complexity of a signal at real time according to input of the signal.--

The paragraph beginning at page 23, line 22, has been amended as follows:

--For example, when coding an input signal for each unit time with a predetermined allocation bit amount b av, the total B av of the allocation bit amount up to [now] a current time is compared to the total B gen of the actually generated coding bit amount up to [now] the current time, and if the value (B av - B gen) is positive, it is allowed to assign an allocation bit amount equal to or above the b av. Here, the b av is defined as follows: b av = T GOP x BV/T SEQ, wherein BV is a bit amount which can be used in the signal recording medium for recording a moving picture, T SEQ is a time length of the moving picture image sequence which can be recorded on the signal recording medium; and T GOP is given in a unit time length. Thus, it is possible to guarantee that a predetermined time length of signal can be recorded on a recording medium having a predetermined storage capacity.--

The paragraph beginning at page 24, line 9, has been amended as follows:

--According to the information used when modifying the aforementioned allocation [sign] data amount reference value into an actual allocation data amount, the input signal is subjected to a pre-filter processing and the processed signal is coded, thus enabling [to make] the signal coding deterioration to be made less remarkable. More specifically, when suppressing the aforementioned actual allocation amount below the allocation [sign] data amount reference value, the input image is subjected to a low-pass filter processing, thus enabling [to make] the image coding deterioration to be made less remarkable.--